13. Visual Effects

Visual effects deal broadly with the extent to which the proposed action or alternative(s) would either: 1) produce light emissions that create annoyance or interfere with activities; or 2) contrast with, or detract from, the visual resources and/or the visual character of the existing environment. Visual effects can be difficult to define and assess because they involve subjectivity. Proposed aviation and aerospace actions do not commonly result in adverse visual effects, but these effects may occur in certain circumstances. For clarity and uniformity, visual effects are broken into two categories: 1) *Light Emission Effects;* and 2) *Visual Resources and Visual Character*. These two categories are defined in more detail below and should be discussed separately in a NEPA document.

Visual effects on resources discussed in other sections of a NEPA document (e.g., Section 106, Section 4(f)), should be discussed in those sections, and cross-referenced in this section. In those cases, the NEPA document need not include a detailed discussion of affected environment and environmental consequences in the visual effects section.

Visually-protected coastal areas, rivers protected under the Wild and Scenic Rivers Act, sensitive wildlife species, and Section 106, Section 4(f), and Section 6(f) properties can be located within or near a project area and could be affected by light emissions and/or changes to visual resources and the visual character. There is overlap between other impact categories and visual resources, because resources covered under other impact categories are among the elements that make up our visual environment. The visual impacts of the proposed action and alternative(s) should be discussed in detail under those appropriate impact categories, as follows:

- Chapter 2 – *Biological Resources* (for impacts to sensitive wildlife species);
- Chapter 4 – *Coastal Resources*;
- Chapter 5 – *Department of Transportation Act, Section 4(f)*;
- Chapter 8 – *Historical, Architectural, Archeological, and Cultural Resources* (for impacts to Section 106 properties); and
- Chapter 14, Section 14.5 – *Wild and Scenic Rivers.*

These items may be briefly discussed or touched upon in the Visual Effects section of a NEPA document to acknowledge their visual significance, with reference provided to the sections that contain the more detailed discussion, as necessary, to avoid duplicate analysis. Coordination between the various sections may be required to ensure that adequate analysis is provided across all impact categories.

Light Emissions

Light emissions include any light that emanates from a light source into the surrounding environment. Examples of sources of light emissions include airfield and apron flood lighting, navigational aids, terminal lighting, parking facility lighting, roadway lighting, safety lighting on launch pads, additional lighting to support nighttime commercial space launches, and light generated from such launches. Glare is a type of light emission that occurs when light is reflected off a surface (e.g., window glass, solar panels, or reflective building surfaces).

Visual Resources and Visual Character

Visual resources include buildings, sites, traditional cultural properties, and other natural or manmade landscape features that are visually important or have unique characteristics. Visual resources may include structures or objects that obscure or block other landscape features. In addition, visual resources can include the cohesive collection of various individual visual resources that can be viewed at once or in concert from the area surrounding the site of the proposed action or alternative(s). In unique circumstances, the nighttime sky may be considered a visual resource.

Visual character refers to the overall visual makeup of the existing environment where the proposed action and alternative(s) would be located. For example, areas in close proximity to densely populated areas generally have a visual character that could be defined as urban, whereas less developed areas could have a visual character defined by the surrounding landscape features, such as open grass fields, forests, mountains, or deserts, etc.

13.1. Regulatory Setting

Exhibit 13-1. Statutes Related to Visual Effects

Statute	Location in U.S. Code	Implementing Regulation(s)	Oversight Agency	Summary
Not applicable	Not applicable	Not applicable	Not applicable	There are no special purpose laws or requirements for visual effects.

Some visual resources are protected under Federal, state, or local regulations. Protected visual resources generally include, but are not limited to, Federal, state, or local scenic roadways/byways; Wild and Scenic Rivers; National Scenic Areas; scenic easements; trails protected under the National Trails System Act or similar state or local regulations; biological resources; and features protected under other Federal, state, or local regulations.

Although there are no Federal special purpose laws or requirements specific to light emissions and visual effects, there are special purpose laws and requirements that may be relevant. In addition to NEPA, laws protecting resources that may be affected by visual effects include

Section 106 of the National Historic Preservation Act (NHPA), Section 4(f) of the DOT Act, the Wild and Scenic Rivers Act, the Coastal Zone Management Act, and state and regional coastal protection acts. Visual resources are also protected and managed on Federal resource lands, such as under U.S. Forest Service Resource Management Plans and the Bureau of Land Management Visual Resource Management System. In addition, there may be state and local regulations, policies, and zoning ordinances that apply to visual effects.

13.1.1. Consultations, Permits, and Other Approvals

There are typically no formal required Federal consultation processes, permits, or other approvals related to visual effects. Although there are no specific consultation requirements, informal coordination with other Federal, state, tribal, and local agencies and the public may be helpful in determining the nature and extent of potential visual effects from the proposed action and alternative(s).

13.2. Affected Environment

The affected environment for light emissions should be addressed separately from that for visual resources and visual character effects. In cases where the visual resources in, and/or the visual character of, a project area could be affected by light emissions, this should be discussed in both the light emissions discussion and the visual resources and visual character effects discussion.

13.2.1. Light Emissions

People, wildlife, and land uses that could be affected by light emissions from the proposed action and alternative(s) should be considered, including the extent to which they are currently affected by existing light emissions. A general discussion of the current level of light emissions, including glare, coming from aviation/aerospace related, and non-aviation/aerospace related sources in a project area (e.g., residential developments, roadway lighting) should be included to establish baseline conditions. Also, the unique resources of the area that could be affected by light emissions and unique characteristics of the area should be considered. Characteristics to consider include such things as the presence or absence of existing sources of light, vegetation that screens or filters light and glare, and urban sources of light. Unique resources may include both protected and unprotected visual resources. Historic properties, parks, traditional cultural properties, and light-sensitive wildlife species should be discussed in detail in the appropriate impact category section, but should also be mentioned briefly under this header (see discussion in introduction above).

13.2.2. Visual Resources and Visual Character

Potentially affected visual resources and the visual character within the study area should be discussed to establish baseline conditions. The aesthetic value and any unique aspects of the area, including any protected visual resources, should be considered and discussed. In determining the existence of unprotected visual resources, input from the community is important. More detailed information about such properties should be provided in the appropriate visual effects section (see discussion in introduction above).

13.3. Environmental Consequences

To the extent that visual effects are relevant to other impact categories (e.g., light emission impacts on biological resources, including migratory birds and marine mammals; properties protected under Section 4(f); and historic properties under Section 106 of the NHPA), those impacts should be discussed in the relevant sections of the NEPA document and cross-referenced in this section, as appropriate. Where impacts related to visual resources and visual character would only be due to light emissions, the discussion of those impacts should be presented under the light emissions heading.

Appropriate design factors should be discussed with respect to the degree to which they would offset any visual impacts. Examples of design factors at airports and commercial launch sites include:

- decorative lighting fixtures, and lighting that is shielded to reduce light emissions; and
- new facilities or major terminal expansions that recognize and are compatible with an area's notable architectural, cultural, or ethnic assets through architecture, design, and/or landscaping.

Public involvement and consultation with appropriate Federal, state, local agencies and tribes may help determine the extent of visual impacts. Consider state and local regulations, policies, and zoning ordinances that protect against light and visual annoyances, and the extent to which the proposed action and alternative(s) would conflict with such regulations. For example, obstructions of historical properties, land features of importance, and man-made monuments may be regulated under state or local requirements that need to be considered.

13.3.1. Light Emissions

Light emission impacts are typically related to the extent to which any lighting or glare associated with the proposed action or alternative(s) would create an annoyance for people in the vicinity and/or would interfere with their normal activities, including work and recreation. The light emissions that would be created by the proposed action and alternative(s) should be compared to baseline conditions to determine if there is a potential for annoyance and adverse impacts. Include consideration of whether nighttime construction activities would cause substantial increases in light or require lighting that would cause annoyance or disrupt normal activities.

When the potential for annoyance exists, information should be included in the analysis such as the location of lights or light systems, pertinent characteristics of the lighting (e.g., intensity, flashing sequence for strobe lighting, and color) and its intended use (e.g., security lighting, runway lighting), and mitigation measures that could be implemented to lessen any annoyance, such as shielding or angular adjustments. If helpful, a map can be included that shows the locations of homes and other light-sensitive sites in the affected environment relative to the proposed lighting system. If there is the potential for significant impacts, the responsible FAA official should consider whether a special lighting study is warranted.

Unique situations may require special analysis, such as:

- Native American traditional cultural places, protected tribal resources, and Indian sacred sites that may be affected by light emissions;

- unique areas that are valued for dark skies where light emissions would be substantially increased; and
- light-sensitive biological resources in the area, including migratory birds and marine mammals.

13.3.2. Visual Resources and Visual Character

Visual resources and visual character impacts are typically related to a decrease in the aesthetic quality of an area resulting from development, construction, or demolition. Analysis of visual impacts considers whether the proposed action and alternative(s) would affect, obstruct, substantially alter, or remove visual resources including buildings, historic sites, or other landscape features, such as topography, water bodies, or vegetation, that are visually important or have unique characteristics. When the potential to obstruct a visual resource exists, information should be included in the analysis such as how a project would alter the character and quality of views and the number of locations from which the resource can be viewed. Visual impacts that affect historical and cultural resources can also be relevant in the NHPA Section 106 review (see Chapter 8). The visual sight of aircraft and commercial space launch vehicles, aircraft and commercial space launch vehicle contrails, or aircraft lights at night, particularly at a distance that is not intrusive, should not be assumed to constitute an adverse effect.

The proposed action and alternative(s) may complement or contrast with the area's visual character. The degree of any contrast should be evaluated. Contrast would not always necessarily cause an adverse effect (i.e., it could have an only mildly discernible effect or a positive effect on the aesthetics of the area). Additionally, where the existing visual character of a project area is not unique or visually important, any contrast with the proposed action and alternative(s) would be less likely to create an adverse effect. Consider if design arts (e.g. architectural design) could lessen any adverse impacts.

13.3.3. Significance Determination

The FAA has not established a significance threshold for visual effects in FAA Order 1050.1F; however, the FAA has identified factors to consider when evaluating the context and intensity of potential environmental impacts for visual effects (see Exhibit 4-1 of FAA Order 1050.1F). Please note that these factors are not intended to be thresholds. If these factors exist, there is not necessarily a significant impact; rather, the FAA must evaluate these factors in light of context and intensity to determine if there are significant impacts. Factors to consider that may be applicable to visual effects include, but are not limited to:

- Light Emissions Effects
  - The degree to which the action would have the potential to create annoyance or interfere with normal activities from light emissions; and
  - The degree to which the action would have the potential to affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.

- Visual Resources and Visual Character Effects
  - The degree to which the action would have the potential to affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources;
  - The degree to which the action would have the potential to contrast with the visual resources and/or visual character in the study area; and
  - The degree to which the action would have the potential to block or obstruct the views of visual resources, including whether these resources would still be viewable from other locations.

13.4. Mitigation

Common operational mitigation measures related to visual effects include:

- Light Emissions:
  - Shielding/baffles to reduce light emissions; and
  - Angular adjustments.
- Visual Resources and Visual Character:
  - Project modifications that would reduce the adverse impacts of visual encroachments into residential or recreational areas; and
  - The application of design, art, architecture, and landscape architecture to visually enhance an infrastructure project or obscure potentially intrusive or adverse visual impacts.